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2001 EIS Conference

Late-Breaking Reports Schedule

— Friday, April 27, 2001 —

10:30 Late-Breaking Reports. Moderator: Ann M. Dellinger

10:35 Estimation of Drug Coverage When Reliable Population Estimates Are Not Available and Budgets are Limited: Lymphatic Filariasis Elimination Project — Leogane, Haiti, 2000. *Els Mathieu*

10:45 Low Varicella Vaccine Effectiveness in a Daycare Center Outbreak — New Hampshire, December 2000–February 2001. *Brent R. Lee*

10:55 Cluster of Scleromyxedema-like Disease in Renal Transplant Patients — San Diego, 1997–2000. *Michelle G. Goveia*

11:05 No Pain, No Gain: Catch-Up After Non-Standard Vaccination Practices — Indiana, 2000. *Shawn R. McMahon*

11:15 Meningococcal Disease Epidemic — Benin, 2001. *Pratima Raghunathan*.

11:25 Impact of the Influenza Vaccine Supply Delay on the U.S. Population — 2000. *Scott A. Harper*

11:35 Sudden Unexplained Illness and Death — Haiti, 2001. *Reneé Joskow*.

11:45 County Fair Attendance Increases Risk for *Escherichia coli* O157:H7 Infection. *John A. Crump*.

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Late-Breaking Reports: Abstracts

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10:30 Late-Breaking Reports. Moderator: Ann M. Dellinger

10:35 *Els Mathieu, S. McLaughlin, J. Radday, M. Deming, P. Lammie, M. Beach, D. Addiss* **Estimation of Drug Coverage when Reliable Population Figures are not Available and Budgets are Limited: Lymphatic Filariasis Elimination Project — Leogane, Haiti, 2000**

Background: Lymphatic filariasis, caused by the mosquito-transmitted parasite *Wuchereria bancrofti*, is ranked by the World Health Organization as the second leading cause of permanent disability worldwide. In a global effort to eliminate the disease, annual mass treatment with diethylcarbamazine (DEC) and albendazole is recommended to interrupt transmission. High drug coverage (>80 %) in the entire population during 5–10 years is required. There is little experience with inexpensive methods to assess drug coverage when reliable population figures are not available and budgets are limited.

Methods: In October 2000, 70,360 persons in Leogane Commune received drugs during the first mass treatment. Drug coverage was assessed by three different methods: a cluster sample survey of residents using probability sampling which required mapping and listing of houses (PS) (sample size [n]= 1220) and two cluster surveys using convenience samples: 1) residents of 10 households near each of the 102 distribution points (DPS) (n=3866), and 2) children attending the primary school closest to each PS cluster (SS) (n=5036). Participants were asked if they had taken the drugs during the distribution. Costs of each survey were calculated.

Results: Drug coverage estimates from PS, DPS and SS, respectively, were 69.3% (95% confidence interval (CI)=64.4-74.8), 72.0% (CI=68.4-75.6) and 78.0% (CI=74.1-81.9). The surveys costs were \$2235, \$990 and \$331, and required 166, 80 and 24 person-days, respectively.

Conclusions: Estimated coverage during the first mass distribution was 69.3% using PS. The results from the convenience samples and PS were not statistically significantly different. The SS was the least expensive and time consuming. For filariasis elimination programs with limited budgets, convenience samples, in particular SS, may have a role in assessing drug coverage.

Key words: lymphatic filariasis, cost analysis, community-based distribution, survey methods

10:45 *Brent R. Lee, K. Galil, M. Eaton, C. Carraher, J. Greenblatt, J. Seward* **Low Varicella Vaccine Effectiveness in a Daycare Center Outbreak — New Hampshire, December 2000–February 2001**

Background: Since varicella vaccine licensure in 1995, there have been seven investigations showing vaccine effectiveness (VE) to range from 71-91%. Following reports of a high proportion of vaccine failures, we investigated a varicella outbreak at a day care center (DCC) in New Hampshire to determine VE.

Methods: A varicella case was defined as a maculopapulovesicular rash without other apparent cause occurring in a DCC attendee between 12/01/2000-2/1/2001. A breakthrough case (BT) was varicella

occurring >42 days after vaccination. We distributed questionnaires to parents and providers of DCC attendees to obtain demographic information, disease and vaccination history, and risk factors for vaccine failure. Vaccination data were verified from provider records. Suspected cases were confirmed by varicella culture or PCR when possible. We calculated VE for all continuously attending children aged >12 months who did not have prior history of varicella and who had not received vaccine during the study period.

Results: Ninety-five (100%) parent and 94 (99%) provider questionnaires were returned. Vaccination coverage was 76%. Of 23 cases of varicella, 15 (65%) occurred in vaccinated children and eight (35%) occurred in unvaccinated children. The index case was a four year-old vaccinee who developed BT on 12/1/00. The median age of cases was 4.4 years (range 1-7). Varicella was cultured in one case, and identified by PCR in another. Vaccine effectiveness was 40.5% (95% CI: -7.2, 67) overall and 41.7% (95% CI: 3.7, 64.7) in the building where the outbreak was centered.

Conclusions: Vaccine effectiveness in this outbreak was far lower than previously reported. In addition, the index case was a vaccinated child, suggesting that BT cases may be as infectious as natural varicella.

Key words: varicella vaccine, daycare center outbreak, vaccine effectiveness, breakthrough disease

10:55 Michelle Goveia, G. Windham, E. Wersinger, D. Gilliss
Cluster of Scleromyxedema-like Disease in Renal Transplant Patients — San Diego, 1997–2000

Background: In late 2000, the California Department of Health Services was alerted to a cluster of patients at a San Diego hospital with an unusual cutaneous condition, resulting in severe contractions and limited mobility. The consulting dermatopathologist concluded that the condition had not been previously described. By January 2001, we were aware of 39 similar patients worldwide, all with renal disease. We initiated a case-control study of the original cluster to identify risk factors.

Methods: A case was defined as large areas of hardened skin with raised plaques and a biopsy indicating increased dermal fibroblasts and mucin and an abnormal dermal collagen bundle pattern in a renal transplant recipient at the hospital between 1997 and 2000. Three matched controls per case were selected by renal transplant sequence. Medical charts for cases and controls were reviewed for demographics, procedures, infections, laboratory values, and medications during the time from transplant to onset of disease for cases and the 7 months posttransplant for controls.

Results: Cases (n=8) and controls (n=24) were demographically similar. Matched analysis indicated that cases were more likely than controls to have received posttransplant inpatient dialysis (88% versus 17%; p=0.002), posttransplant kidney biopsy (100% versus 38%; p=0.009), and recombinant erythropoietin (100% versus 26%; p=0.002), and were more likely to have had elevated creatinine levels (88% versus 21%; p=0.008), depressed white blood cell counts (38% versus 4%; p=0.06), and longer donor kidney cold ischemic time (mean: 1,205 versus 743 minutes; p<0.01).

Conclusions: These findings suggest that cases had poor posttransplant kidney function possibly because of prolonged cold ischemic time. A follow-up investigation that will include nontransplant cases is being planned to further explore the identified associations.

11:05 Shawn R. McMahon, J. Cono, I. González, P. Gargiullo, M. Massoudi, T. Murphy
No Pain, No Gain: Catch-Up After Non-Standard Vaccination Practices — Indiana, 2000

Background: Nurse A vaccinated children in a private practice for 11 years. In Fall 2000, findings of full syringes after vaccination raised concerns that Nurse A, who had a reputation for administering “painless” injections, was documenting vaccinations that may not have been administered. To identify children requiring revaccination and to minimize the risk of adverse reactions from excess doses of diphtheria-tetanus-pertussis-containing vaccines (DTP), we developed a protocol that offered testing for antibodies to diphtheria and tetanus among children “vaccinated” by Nurse A.

Methods: Office records of 2,445 children ≤ 16 years old were reviewed to identify children “vaccinated” by Nurse A. Vaccination was recommended for children who received one dose of DTP or other vaccines from Nurse A. Serologic testing (ELISA, Vero cell assay) was offered to children with ≥ 2 doses of DTP from Nurse A. A child was considered unprotected (seronegative) if antibody was <0.01 IU/mL to diphtheria or <0.1 IU/mL to tetanus.

Results: Nurse A initialed vaccine records of 21% (514) of children; 38% (196/514) received ≥ 2 doses of DTP from Nurse A. Serologic testing was obtained for 75% (147/196) of these children; 23% (34/147) were seronegative and vaccination was initiated. Seronegative compared with seropositive children were younger (4.6 ± 3.0 vs. 9.0 ± 2.7 years, respectively, $p < .005$). Seronegative and seropositive children received a mean total of ≥ 3 DTP doses (3.7 and 4.3, respectively). Serologic testing prevented unnecessary DTP vaccination of 113/147 children, an estimated 232 doses.

Conclusions: The relationship between young age and seronegative results likely indicates a change in vaccination practice over time. Serologic testing can be useful to prevent unnecessary vaccination and identify children at risk of vaccine-preventable diseases for whom selective vaccination is indicated.

Key words: vaccine, immunization, child, serologic test

11:15 *Pratima Raghunathan, M. Soriano-Gabarro, J. Armegnigan, D. Yevide, E. Comlanvi, B. Gbechedji, N. Rosenstein*
Meningococcal Disease Epidemic — Benin, 2001

Background: Every 8-12 years, the African “meningitis belt” experiences explosive epidemics of meningococcal disease. During 2001, serogroup A meningococcal disease epidemics are occurring in six African countries, including Benin, with more than 20,300 cases and 2,100 deaths to date. WHO guidelines recommend monitoring of weekly district-level meningitis rates using a threshold rate to trigger mass meningococcal vaccine campaigns. The difficulties of control are exacerbated by the current global shortages of vaccine.

Methods: We reviewed national passive surveillance data for probable cases of meningitis, defined as fever $>38.5^\circ\text{C}$ and stiff neck, reported weekly by districts. To assess clinical case management, we are reviewing medical records of all probable case-patients admitted to two regional hospitals since January 1, 2001. We obtained population data from 1992 national census projections.

Results: Between 1/1 and 3/18/2001, 6147 probable cases and 265 deaths were reported in 4 northern departments of Benin. The case-fatality ratio was 4.3%. By February 23, the epidemic threshold was surpassed in 20 districts, for a total population at risk of 1,391,052. Partial mass vaccination campaigns were conducted between 2/2 and 3/9/2001 with 450,000 doses of vaccine delivered; overall, coverage rates were likely less than 30%. Despite diversion of essential services, personnel and resources, from 3/9 to 3/23/2001, weekly attack rates continued to rise in 11 districts.

Conclusions: Given the availability of only 600,000 doses of vaccine, we recommended targeted vaccination in 11 districts with a goal of $> 80\%$ vaccine coverage. Current control efforts are hampered by difficulties in surveillance and outbreak response as well as an imperfect vaccine. Prevention of epidemics will likely require improved meningococcal vaccines and new strategies.

11:25 *Scott Harper, E. Weintraub, E. Chuhran, A. Curns, B. Imhoff, J. Singleton, N. Cox, K. Fukuda, C. Bridges*
Impact of the Influenza Vaccine Supply Delay on the U.S. Population — 2000

Background: An unprecedented national influenza vaccine supply delay occurred during the 2000 – 2001 influenza season. In October 2000, the Advisory Committee on Immunization Practices (ACIP) recommended focusing early vaccination efforts on persons at high risk for influenza complications (≥ 65 years and < 65 years with chronic medical conditions). We conducted the first assessment of the impact of

this recommendation on vaccine use in the United States.

Methods: In October 2000, questions regarding when influenza vaccine was received and reasons for not being vaccinated were added to the 2000-2001 FoodNet population-based telephone survey. The survey was conducted in a catchment area representing approximately 11% of the U.S. population and included individuals of all ages.

Results: Among 2,236 persons interviewed in December and January, 39% (333/852) of high risk and 13% (186/1384) of non-high risk persons reported having received influenza vaccine. Among vaccine recipients, 27% and 47% of high risk respondents were vaccinated in October and November, respectively, compared with 25% and 55% of non-high risk respondents ($p = 0.5$ and $p = 0.1$, respectively). In October, November, and December, unvaccinated high risk respondents reported lack of vaccine availability as the primary reason for not being vaccinated significantly more often than non-high risk respondents (23% vs. 10%, $p = 0.0005$; 24% vs. 12%, $p < 0.0001$; and 17% vs. 10%, $p = 0.0004$, respectively).

Conclusions: The vaccine delay posed a severe national challenge for maintaining influenza vaccine coverage of high risk persons. Although high risk respondents reported higher rates of vaccination, they did not receive vaccine earlier than vaccinated non-high risk persons, despite the modified ACIP recommendations. High risk respondents were more likely to report difficulty in obtaining vaccine as an obstacle for vaccination than non-high risk respondents.

11:35 Renée Joskow, M. Belson, R. Kaiser, H. Vesper, L. Backer, C. Rubin
Sudden Unexplained Illness and Death — Haiti, 2001

Background: In March 2001, investigators in Haiti reported unexplained illness and death among 100 children aged 15 years and younger. Symptoms included vomiting, seizures, altered consciousness, and sudden death. Similar outbreaks attributed to consuming unripe ackee in 1988 and 1990-91 involved fewer persons. Although ackee is consumed in this region, drought and flooding that destroyed livestock and crops may have encouraged increased unripe ackee consumption or increased toxin concentrations in the fruit. Additionally, malnutrition may have predisposed individuals to the effects of ackee toxin (hypoglycin).

Methods: Our case definition was any person in Cap Haitien region who had documented hypoglycemia or who vomited two or more times per hour (without fever or diarrhea) from November 2000 through March 2001. Questionnaires were administered to case-patients or family members to determine exposure, risk factors, and dietary history. We collected serum and urine samples for analysis of hypoglycin, toxin metabolites, and micronutrient levels.

Results: We identified 63 case-patients of whom 36 died. The median age was 7 years (range 6 months to 88 years); 63% were female. Symptoms included vomiting (97%), loss of consciousness (40%), coma (39%), and seizures (29%). Thirty-six cases (57%) reported eating ackee within 24 hours of symptom onset; 23 (65%) of them ate unripe ackee.

Conclusions: If ackee caused this outbreak, there was either recall bias due to proxy interviews for deceased persons and children, or case-patients consumed other foods that contained ackee toxins. Further laboratory analyses will aid in assessing risk factors and exposure. We recommend local agencies establish active surveillance to identify new cases, confirm exposure, and develop educational campaigns to address the use of ripe ackee.

Keywords: hypoglycin, Haiti, risk factors, micronutrients, epidemiology, disease outbreaks

11:45 John A. Crump, C. Braden, M. Dey, R. Hoekstra, J. Rickelman, D. Baldwin, R. Fini, S. de Fijter, S. Nowicki, L. Nicholson, M. Bundesen, R. Hild, R. Genevie, T. Banneman, E. Koch, F. Smith, C. Selman, P. Mead
County fair attendance increases risk for *Escherichia coli* O157:H7 infection

Background: Fairs bring together ruminant animals- reservoirs for *E. coli* O157- and children in the presence of unregulated water systems. We analyzed two types of data to explore attendance at a county fair as a risk factor for *E. coli* O157 infection, which causes an estimated 60 deaths and 73,000 illnesses annually in the United States.

Methods: To look for illnesses associated with county fairs in Northeast Ohio, *E. coli* O157 surveillance was enhanced from August through September 2000. *E. coli* O157 isolates were subtyped by pulsed-field gel electrophoresis (PFGE). Ohio Public Health Laboratory Information System (PHLIS) data for 1999 were also examined, using a time-varying covariate proportional hazards model, for a temporal association between county fairs and reported *E. coli* O157 infections.

Results: Enhanced surveillance detected clusters of *E. coli* O157 infections associated with four county fairs in Northeast Ohio in August and September 2000 (risk ratio 5.6, 95% CI=2.6-11.8). PFGE patterns of patient *E. coli* O157 isolates were unique for each fair. County-level 1999 PHLIS data, using exposure to a local fair as a time-varying covariate, showed a significant association with the date of a case of *E. coli* O157 infection (relative hazard rate 1.7, 95% CI=1.0-2.8). Investigation of one cluster of cases implicated exposure to fairground water-based products as the risk factor for infection.

Conclusions: We demonstrated clusters of *E. coli* O157 infections associated with county fairs in Northeast Ohio during 2000, and confirmed a general association with reported *E. coli* O157 infections in 1999 using PHLIS data. There may be widespread problems at county fairs that increase risk for *E. coli* O157 infections. This risk may be reduced by promoting adequate fairground water systems and safer interactions between children and animals.

Key words: *Escherichia coli* O157, water, animals, zoonoses